

THERE IS CLAIMED:

1. A multisource antenna including at least two excitation sources and spatial and frequency selective means for spatially channeling energy picked up/radiated by said excitation sources and providing for frequency decoupling between the bands respectively corresponding to the waves received/transmitted by said sources, which are arranged on a ground plane to interleave radiating apertures at the level of said spatial and frequency selective means.
2. The antenna claimed in claim 1 wherein said spatial and frequency selective means comprise a forbidden photonic band array.
3. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises an arrangement of dielectric plates with a one-dimensional period (1D arrangement).
4. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises an arrangement of dielectric rods with a two-dimensional period (2D arrangement).
5. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises an arrangement of dielectric rods with a three-dimensional period (3D arrangement, woodpile type).
6. The antenna claimed in claim 2 wherein the forbidden photonic band array comprises a periodic arrangement of metal patterns.
7. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises a periodic arrangement of slots in said ground plane.
8. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises an arrangement of metal wires.
9. The antenna claimed in claim 1 wherein said excitation sources form a passive focal array, the interleaving of the radiating apertures associated with each source of said passive focal array generating an energy channel radiated over an enlarged apparent surface area at the level of the forbidden photonic band array.
10. The antenna claimed in claim 1 wherein said excitation sources operate in different frequency bands and with the same radiating aperture.
11. The antenna claimed in claim 2 wherein said excitation sources operate in different frequency bands and with the same radiating aperture and said forbidden photonic band array comprises at least two metal plates

with resonating patterns resonating at their natural frequency and transparent at the other resonant frequency.

12. The antenna claimed in claim 2 wherein said forbidden photonic band array comprises a periodic arrangement of metal wires, some of which wires are locally and periodically removed to form a second operating band independent of the first.
13. The antenna claimed in claim 11, wherein one metal plate forms a reflective surface at a highest operating frequency and is transparent at a lowest operating frequency, being at a distance of  $\lambda_{fh}/2$  from said ground plane, and a second metal plate forms a surface reflective at said lowest frequency and transparent at said highest frequency, being at a distance of  $\lambda_{fh}/2$  from said ground plane.
14. The antenna claimed in claim 2, wherein said forbidden photonic band array comprises a periodic arrangement of dielectric plates, the thickness of one of which is modified relative to the others, this disruption of the period producing a second operating band independent of the first.
15. The antenna claimed in claim 1, wherein at least one source operates in a receive frequency band and another source operates in a transmit frequency band.
16. The antenna claimed in claim 1, adapted to operate in a system with a reflector.